

REMARKS/ARGUMENTS

1. Claim Amendments

The Applicant has amended Claims 40-41 and 58-59 and claims 37-39, 42-57 and 60-72 have been cancelled. Applicant respectfully submits no new matter has been added. Accordingly, Claims 40-41 and 58-59 are pending in the application. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks.

2. Claim Rejections – 35 U.S.C. § 102(b)

Claims 37, 55 and 71 stand rejected under 35 U.S.C. 102(b) as being anticipated by Meyer et al. (EP 1249972 A1). The Applicants have cancelled claims 37, 55 and 71 rendering the rejection of those claims moot.

3. Claim Rejections – 35 U.S.C. § 103 (a)

The Examiner rejected claims 38, 39, 42, 44-47, 49-53, 56, 57, 60, 62-65, and 67-70 under 35 U.S.C. § 103(a) as being unpatentable over Meyer et al in view of Hadi Salim, et al. (US 6,535,482). The Applicants have cancelled claims 38, 39, 42, 44-47, 49-53, 56, 57, 60, 62-65, and 67-70 rendering the rejection of those claims moot.

The Examiner rejected claims 40 and 41 under 35 U.S.C. § 103(a) as being unpatentable over Meyer et al in view of Hadi Salim, et al. as applied to claims 38 above, and further in view of Minhazuddin et al (2004/0073641). Applicant respectfully traverses the rejection. The Examiner continues to hold that Meyer discloses (from the Office Action):

wherein the automatic threshold adaptation procedure is operable in one of at least a first and a second adaptation mode. Examiner is interpreting this first and second adaptation mode as using two different thresholds which Meyer et al discloses in paragraph [0062]. Further, Meyer et al teaches the different "modes" accomplishing the same threshold calculations and outcomes as the claimed invention. Meyer et al discloses the first adaptation mode adapting the threshold value (in this case, using the minimum threshold) on the basis of $n \cdot LC$ (minimum threshold is calculated by setting equal to LC, therefore an arbitrary

number of 1 could applied as n [0062]), where LC represents the estimated link capacity value (LC is calculated based on an estimated link capacity [0062]) and $n \geq 1$, and the second adaptation mode (in this case, using the maximum threshold) being adapted to the threshold value on the basis of $m \cdot LC$, where $m > 1$ and $m > n$ (max threshold can be calculated from LC times a constant epsilon which can be from 3-6, therefore greater than 1 and greater than the above constant [0066]). Naturally, as Meyer et al discloses, when the $QLav$ passes one of these thresholds, appropriate action is taken based on the threshold passed.

Applicant continues to disagree with the Examiner's interpretation of Meyer because while Meyer discloses one mode for determining drop thresholds min_{th} and max_{th} , the present invention contemplates, and claims, multiple modes and a mechanism for choosing the appropriate mode depending on additional conditions.

Meyer discloses a method to set $Tmin$ and $Tmax$ based on the round trip time and the instantaneous data rate:

$$Tmin = f(dataRate, roundTripTime)$$

$$Tmax = f(dataRate, roundTripTime)$$

taking into account that $linkCapacity = dataRate * roundTripTime$. This can be written as:

$$Tmin = f(linkCapacity)$$

$$Tmax = f(linkCapacity)$$

In the present invention, only $Tmin$ is determined and is referred to as "QL".

So, the present invention adds another input parameter to the functions above:

$QL = Tmin = f(linkCapacity, something)$, where the $something$ could be a preconfigured parameter based on $measuredDataLossRate$

To reiterate, Meyer discloses a mechanism to determine the active queue management thresholds based on the round trip time and the instantaneous data rate. Said thresholds are the min- and max-threshold which are typically associated with different drop probabilities. The active queue management mechanism uses both these thresholds at a time. More precisely it determines the instantaneous drop probability from the current queue fill state "Q" by interpolating between $P(min)$ and $P(max)$.

Furthermore, the thresholds t_{\min} and t_{\max} are adapted to the instantaneous data rate or namely to the instantaneous link capacity (LC).

The present invention improves on the foregoing. As claimed, it provides that the conversion from LC to t_{\min} and t_{\max} could be made adaptive as well.

In other words, Meyer discloses a mechanism to determine the active queue management (AQM) thresholds based on the round trip time and the instantaneous data rate. Said thresholds are the minimum and maximum thresholds which are typically associated with different drop probabilities. The AQM mechanism uses both these thresholds at a time. More precisely, it determines the instantaneous drop probability from the current queue fill state "Q" by interpolating between $P(\min)$ and $P(\max)$. Furthermore, the thresholds \min_{th} and \max_{th} are adapted to the instantaneous data rate or namely to the instantaneous link capacity (LC). The present invention claims, in addition, that the conversion from LC to \min_{th} and \max_{th} could be made adaptive as well.

Note that Applicants disclose one or more "a length threshold values," (equivalent to \min_{th} and \max_{th}) that can be computed based on said first or second adaptation mode of operation. The adaptation mode of operation can either be configured or by a mode selection function (as further claimed). The objective of the present invention, not contemplated by the cited reference, is to make the queue management algorithm less aggressive if, for example, other sources of packet loss have been detected. Hence, while Meyer discloses one mode for determining drop thresholds \min_{th} and \max_{th} , the present invention contemplates, and claims, multiple modes and a mechanism for choosing the appropriate mode depending on additional conditions.

The Examiner acknowledges that Meyer does not explicitly disclose wherein the queue buffer is arranged for receiving data units from a sender that performs window-based flow control and divides its send window by k , $k > 1$, when receiving a congestion notification or when detecting data unit loss, wherein $n = k - 1$ and $m = kA - 1$. He looks to Hadi Salim for the missing elements.

The Examiner states:

Hadi Salim et al teaches wherein the queue buffer is arranged for receiving data units from a sender that performs window-based flow control (TCP source reduces the window to control the flow [6,9-12] , herein [X,X] in Hadi Salim et al refers to [Column, Line(s)]) and divides its send window by k , $k > 1$, (source reacts by halving the congestion window (therefore an arbitrary k would equal 2 [6,39-42]) when receiving a congestion notification (ECN-notify set in the header means source knows there is congestion [6,39-42]) or when detecting data unit loss, wherein $n = k - 1$ and $m = kA^{2-1}$ (if the arbitrary k is 2 as taught by Hadi Salim then $n = 1$, as disclosed by Meyer, and $m = 3$, as disclosed by Meyer et al above). It would have been obvious for one of ordinary skill in the art in the area of controlling congestion in a network to include window-based flow control as taught by Hadi Salim et al in the method of Meyer et al in order to handle transient congestion.

Applicant is unable to map the elements of this second reference to the present invention as place-keepers have been inserted for the reference pages and lines. MPEP 706.02(j) provides:

706.02(j) Contents of a 35 U.S.C. 103 Rejection [R-6] - 700 Examination of Applications

It is important for an examiner to properly communicate the basis for a rejection so that the issues can be identified early and the applicant can be given fair opportunity to reply.

In any event, Applicant notes that Hadi Salim discloses a router in a network comprising a source node, and a receiver node, and other nodes, a congestion monitor determines a degree of congestion, which is sent back to the source node, using an OSI network layer protocol. This enables the flow of packets from the source to be controlled more accurately to maintain high throughput with reduced probability of congestion. Using the network layer rather than lower layers can ensure the indication can be carried across the entire network, and not be lost at boundaries between data links making up the network. Hadi Salim and Minhazuddin, alone or in combination, fail to overcome the deficiencies of Meyer.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations (MPEP 2143). In that regard, the Applicant respectfully submits that the Examiner's references fail to teach or suggest each and every element of the presently pending claims 40-41.

The Examiner rejected claims 58 and 59 under 35 U.S.C. § 103(a) as being unpatentable over Meyer et al in view of Minhazuddin. Applicant respectfully traverses the rejection. As noted above, several of the elements of the present invention are not found in Meyer or in Minhazuddin.

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The Examiner rejected claims 48 and 66 under 35 U.S.C. § 103(a) as being unpatentable over Meyer et al in view of Hadi Salim et al as applied to claims 45 and 63 above, and further in view of Liao et al (2004/0136379). The Applicants have cancelled claims 48 and 66 rendering the rejection of those claims moot.

The Examiner rejected claims 43 and 61 under 35 U.S.C. § 103(a) as being unpatentable over Meyer et al in view of Hadi Salim et al as applied to claims 42 and 60 above, and further in view of Kawaguchi (5,729,530). The Applicants have cancelled claims 43 and 61 rendering the rejection of those claims moot.

The Examiner rejected claim 54 under 35 U.S.C. § 103(a) as being unpatentable over Meyer et al in view of Hadi Salim et al as applied to claim 52 above, and further in

view of Takada et al (2002/0089931). The Applicants have cancelled claim 54 rendering the rejection of that claim moot.

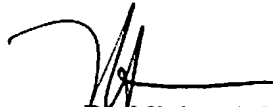
The Examiner rejected claim 72 under 35 U.S.C. § 103(a) as being unpatentable over Meyer et al in view of Takada. The Applicants have cancelled claim 72 rendering the rejection of that claim moot.

CONCLUSION

In view of the foregoing remarks, the Applicant believes all of the claims currently pending in the Application to be in a condition for allowance. The Applicant, therefore, respectfully requests that the Examiner withdraw all rejections and issue a Notice of Allowance for all pending claims.

The Applicant requests a telephonic interview if the Examiner has any questions or requires any additional information that would further or expedite the prosecution of the Application.

Respectfully submitted,



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